Summary

Approval for the conversion of two coal-fired calciners to gas was granted in 1995. The projected DCFRR was 142% as compared to the actual return of 83%. Had sales permitted the facility to produce at the budgeted rate, the return would have been 213%. Calculations were based on the same terms as the AFE using actual cost data for 1996 through 1999. Fiscal year 2000 was excluded due to the unexpected drastic increase in gas price.

Discussion

Conversion of CA-1 and CA-2 coal fired calciners to gas was completed in June 1995 and September 1995, respectively. Had the conversions not been made, the capacity of the calciners could not have been increased. The associated electrostatic precipitators were the limiting factor. With coal-fired calciners the precipitators were at the design maximum volume of air. Conversion to gas reduced the air on a per ton basis thus decreasing the air velocities through the precipitators and effectively increasing their capacity while decreasing particulate emissions. Even at the new, higher calciner capacity, the velocity of the air through the precipitator is less than when the calciners were coal-fired. This reduction in velocity increased the efficiency of the precipitators freeing up an increment of particulate emissions. For modeling purposes, the federal government reduced the limit for PSD for particulate emissions from 37 ug/m^3 to 30 ug/m^3. This change put Solvay out of compliance even prior to the commencement of the SSII expansion. Fortunately, the associated decrease of particulate emissions (37 tpy) that resulted from the coal to gas conversion gave Solvay the necessary increment to do the SSII expansion.

This conversion also reduced the NOx emissions by 609 tpy. SSII consumed 269 tpy of NOx PSD. Since the delta did not trigger the 40 tpy increase for NOx PSD Solvay was not required to perform the model analysis. Decreases in increments must be used within five (5) years and only during one permit application. Had the off-sets not been available, it is possible the expansion could not have been permitted as designed.

Finally, the projected DCFRR of 142% was with a sales increase of 415K tSA for the referenced time frame. While annual sales did not require extended runs at the new annualized production capacity of 2.2 MM tSA, eleven months met or exceeded the project capacity between 1996 and 1999. (Table I). The actual return was 83% with a sales increase of only 63.5K tSA (Table II a & II b). Had sales required the new, higher capacity the return would have been 213% (Table III a & III b).

Future Work

With the spike in gas prices in 2000 and 2001 came the necessity to due a comprehensive study of the requirements to convert the calciners back to coal. While this study will take some time to complete, early indications are it will likely not make economic sense and will require a considerable investment in time and money to determine if it is even possible given the existing environmental regulations.